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RELATIONSHIPS BETWEEN TEMPERAMENT AND GROWTH PERFORMANCE IN BEEF CATTLE

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Background. Researchers with the Texas Agricultural Experiment Station have data that indicate animals with higher concentrations of cortisol when restrained in a squeeze chute have reduced feed intake and reduced average daily gains. The economic implications associated with livestock temperament have not been fully determined (Grandin, 1994). Within the cattle industry we have daily interactions with cattle that are influenced by the temperament of the animal. Many concerns can arise, which include animal handler safety, damage to equipment and facilities, injury to the animal, etc.

The objectives of this study were to evaluate effects of breed of sire, age of dam, and gender on exit velocity (EV, m/s), chute temperament score (CS) and pen temperament score (PS) and measure relationships between EV, CS and PS at two times near weaning.

Research Findings. Angus crossbred calves (n=195) were assigned a pen score (scale of 1 to 5, with 1=non-aggressive, not excited by humans or facilities; to 5=very aggressive, excited, runs into fences, "combative"); calves were weighed on a platform scale and assigned a chute score. Calves were released into a hydraulic squeeze chute and restrained, while in the squeeze chute a blood sample was collected and serum harvested for analysis of cortisol concentrations. Exit velocity was measured using a laser-timing device (FarmTek) over approximately 1.83 m from the chute (m/s). Measurement one (T1) occurred 21 d after weaning and the second measurement (T2) 90 d later. Least square means were obtained from the PROC MIXED procedure of SAS (SAS Institute, 2001) with main effects of sire breed, gender and age of dam. Breed of sire (AN or BN) was not a significant source of variation for EV, CS or PS; however, BN-sired calves had greater ADG compared to AN-sired calves (0.42 ± 0.02 and 0.31 ± 0.05 kg, respectively). Heifers had greater EV and higher PS at T1 and greater EV at T2. The correlation coefficients (r) between EV at T1 and T2 were 0.68 ($P < 0.001$); EV and CS was 0.26 ($P < 0.002$) at T2; EV and PS was 0.489 ($P < 0.001$) at T1 and 0.487 ($P < 0.001$) at T2. The r for EV and calf ADG at T1 was (-0.14, $P = 0.055$) and T2 (-0.13, $P = 0.074$). The r for CS and PS at T1 was (0.19, $P < 0.006$) and at T2 was (0.34, $P < 0.001$).

Application. Breed of sire was not a significant source of variation in chute exit velocity, however, differences existed between steers and heifers. Although the correlation coefficients between exit velocity and temperament score were significantly different from zero the magnitudes were only moderate. In this case, pen score had a better correlation with exit

velocity than chute score. Exit velocity may be the preferred method of measurement due to the subjective nature of the chute and pen temperament scores.

Table 1. Mean exit velocity for pen scores at two time points near weaning.

Pen Score T1	Exit Velocity (m/s)	Pen score T2	Exit Velocity (m/s)
1 (n=4)	1.30 ± 0.33 ^{xy}	1 (n=15)	1.55 ± 0.23 ^w
2 (n=155)	1.49 ± 0.09 ^x	2 (n=103)	2.12 ± 0.13 ^x
3 (n=93)	1.88 ± 0.10 ^y	3 (n=64)	2.56 ± 0.13 ^y
4 (n=29)	2.44 ± 0.15 ^w	4 (n=13)	3.68 ± 0.24 ^z
5 (n=4)	2.90 ± 0.33 ^w	5 (n=0)	

^{wxyz}Means with different superscripts within the columns differ P < 0.01.

Table 2. Mean exit velocity for chute scores at two times near weaning.

Chute Score T1	Exit Velocity (m/s)	Chute Score T2	Exit Velocity (m/s)
1 (n=48)	1.67 ± 0.13	1 (n=94)	2.20 ± 0.14 ^x
2 (n=158)	1.61 ± 0.10	2 (n=77)	2.32 ± 0.15 ^x
3 (n=75)	1.73 ± 0.11	3 (n=22)	3.11 ± 0.21 ^y
4 (n=4)	2.25 ± 0.37	4 (n=2)	3.00 ± 0.62 ^{xy}
5 (n=0)		5 (n=0)	

^{xy}Means with different superscripts within the column differ P < 0.01.

Table 3. Mean differences between steers and heifers for chute and pen scores and exit velocity at two times near weaning.

Item	Steers	Heifers	P-value
Weight T1 (kg)	206.03 ± 4.4	193.98 ± 4.7	< 0.002
Weight T2 (kg)	233.68 ± 6.3	225.71 ± 6.0	NS
Chute Score T1	2.1 ± 0.10	2.2 ± 0.10	NS
Chute Score T2	1.6 ± 0.12	1.5 ± 0.12	NS
Pen Score T1	2.5 ± 0.10	2.3 ± 0.11	< 0.045
Pen Score T2	2.5 ± 0.13	2.4 ± 0.12	NS
Exit velocity T1 (m/s)	1.56 ± 0.10	1.75 ± 0.10	= 0.032
Exit velocity T2 (m/s)	2.22 ± 0.15	2.48 ± 0.14	= 0.056